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PII: S0022-1031(08)00206-0
DOI: 10.1016/j.jesp.2008.10.003
Reference: YJESP 2177

To appear in: *Journal of Experimental Social Psychology*

Received Date: 17 May 2008
Revised Date: 15 August 2008
Accepted Date: 1 October 2008

Please cite this article as: Krieglmeyer, R., Wittstadt, D., Strack, F., How Attribution influences Aggression: Answers to an old Question by using an Implicit Measure of Anger, *Journal of Experimental Social Psychology* (2008), doi: 10.1016/j.jesp.2008.10.003

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Word count: 5174

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Abstract

The present study investigated how aggressive reactions to frustration are influenced by attributional processes. In particular, we examined how the information that another person did not intend a frustration affects anger and aggression. Previous research was inconclusive if attribution to unintentionality decreases anger and aggressive impulses or if it increases the control of aggressive impulses resulting in a selective decrease of aggressive reactions that are controllable. To test these assumptions, two thirds of participants were frustrated by negative evaluations that were paired with aversive sounds from an ostensible team partner. The remaining participants received positive evaluations that were paired with pleasant sounds. Then, half of the frustrated participants obtained a message suggesting that their partner had confused the response scale and had actually meant to deliver an opposite evaluation. This apologizing information was effective in decreasing subsequent aggressive behavior but not in reducing anger as assessed by an implicit measure. This finding is in line with the notion that attribution to unintentionality leads to control of aggressive impulses. We conclude that such attributions influence aggressive behavior mainly via reflective pathways, while impulsive processes remain largely unaffected.

"I didn't mean it" is an expression we sometimes hear if we have been offended by another person. It is meant to tell us that the person has not intended to hurt us. Instead of attributing his behavior to malevolent goals (cf. Jones & Davis, 1965; Ross, Greene, & House, 1977) and paying him back in his own coin, we acknowledge his good faith and refrain from retaliation. Not only apologies but also knowledge of legitimacy, nonarbitrariness, or mitigating circumstances may lead to a decrease in aggressive responses (e.g., Berkowitz, 1981; Burnstein & Worchel, 1962; Dill & Anderson, 1995; Zillmann & Cantor, 1976). What these conditions have in common is that frustration is not attributed to the intention of another person but to the circumstances, which we will refer to in the following as *attribution to unintentionality*.

As long as the relationship between attribution and aggression has been studied, the question has been raised if attributions to unintentionality actually decrease anger and aggressive impulses or merely increase the control of aggressive impulses (e.g., Burnstein & Worchel, 1962). This discussion is related to a controversial debate about the degree to which attributions and appraisals are necessary for anger and aggression to occur (Berkowitz & Harmon-Jones, 2004; Roseman, 2004; Smith & Kirby, 2004). In particular, attribution theory (Weiner, 1985; Weiner, Graham, & Chandler, 1982) as well as appraisal theories (Lazarus, 1991; Roseman, 2004; Smith & Kirby, 2004) assume that attribution to intentionality is necessary for anger to occur. This suggests that attribution to unintentionality should decrease anger and aggressive impulses.

In contrast, Berkowitz's cognitive-neoassociationistic model of aggression (Berkowitz, 1990) proposes that anger and aggressive impulses can arise independent of attributions. In this view, negative stimulation activates an anger-aggression network that consists of anger-related thoughts and feelings, as well as aggressive behavior schemata. It is at a later stage of processing that attributions can modify this initial reaction.

Similar ideas have been expressed in dual-system models of social information processing and behavior (e.g., Chaiken & Trope, 1999; Lieberman, Gaunt, Gilbert, & Trope, 2002; Smith & DeCoster, 2000; Strack & Deutsch, 2004). In general, these theories distinguish between an automatic or impulsive and a controlled or reflective system of information processing. For instance, the Reflective-Impulsive-Model (*RIM*; Strack & Deutsch, 2004, 2007) proposes that affect and impulses are activated automatically by associative processes, whereas decisions are generated in a resource-dependent way based on propositional representations and syllogistic inferences. Supporting this reasoning, propositional representations like negations have been shown to influence conscious decisions but not quick affective responses (Deutsch, Gawronski, & Strack, 2006). Applied to the case of attribution and aggression, this theorizing suggests that attribution to unintentionality, which requires the representation of the knowledge that a frustration was *not* intended, mainly influences conscious decisions, while affect and impulses remain unaffected.

Previous Research

Although the influence of attribution on anger and aggression has been studied for quite a while (cf. Pastore, 1952), conclusive evidence is still lacking. To find out if attribution to unintentionality decreases anger and aggressive impulses or if it increases control of aggressive impulses, some studies manipulated the motivation to control aggressive impulses by varying the privacy of aggressive expression (Burnstein & Worchel, 1962; Rule, Dyck, & Nesdale, 1978). If attribution to unintentionality merely increases control of aggressive impulses due to social norms, privacy should lower control motivation and thus lead to more aggression than public conditions. Burnstein and Worchel (1962) found supporting evidence for aggression control, while Rule et al. (1978) found evidence for lowered aggressive impulses. Besides the inconclusiveness of these findings, the privacy

manipulation may be problematic as aggression control may not only occur because of social norms but also because of personal standards. Consequently, even under private conditions participants may control their aggressive impulses to conform to their own personal standards.

Other studies assessed self-reported anger as a proxy for aggressive impulses and compared it to aggressive behavior. Most of these studies found that attribution to unintentionality reduced self-reported anger as well as aggressive behavior, concluding that such an attribution decreases anger and aggressive impulses (Epstein & Taylor, 1967; Kulik & Brown, 1979; Nickel, 1974; for different results see Dill & Anderson, 1995). However, from the perspective of dual-system models (e.g., Smith & DeCoster, 2000; Strack & Deutsch, 2004) and recent research on the consistency of implicit and explicit measures in the attitude domain (e.g., Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005), it seems possible that self-report measures may not reflect uncontrolled anger and aggressive impulses. Because such measures are based on propositions, they are susceptible to attributions and control processes as well.

In an attempt to measure uncontrolled anger and aggressive impulses, physiological arousal has been examined (Berkowitz, 1981; Johnson & Rule, 1986; Kremer & Stephens, 1983; Zillmann & Cantor, 1976). Zillmann and Cantor (1976) as well as Johnson and Rule (1986) report that attribution to unintentionality decreased physiological arousal, supporting the assumption of lowered aggressive impulses. In contrast, Berkowitz (1981) found that irrespective of attributions frustration increased arousal. In a similar vein, Kremer and Stephens (1983) showed that attribution to unintentionality increased physiological arousal, but reduced aggressive behavior, confirming the assumption that attribution merely increases control. However, although arousal is difficult to control and people may be unaware of the fact that a physiological indicator of anger is being measured, there are other problems with

that measure. In particular, Kremer and Stephens (1983) point out that physiological arousal may not only reflect anger but also the cognitive effort caused by making attributions or trying to empathize with the aggressor. As some authors manipulated attributions by inducing sympathy for the stressfull situation of the aggressor (e.g., Johnson & Rule, 1986; Kremer & Stephens, 1983; Zillmann & Cantor, 1976), such processes might have occurred.

The Present Research

To examine the processes underlying the influence of attribution to unintentionality on aggression, we manipulated frustration and attribution, and measured implicit anger as well as aggressive behavior. We employed an implicit measure of anger that has been developed by DeMarree, Wheeler and Petty (2005) on the basis of a validated implicit mood measure (Hass, Katz, Rizzo, Bailey, & Moore, 1992; Koole, Smeets, van Knippenberg, & Dijksterhuis, 1999)[1]. This measure is implicit in the sense that participants are unlikely to be aware of the fact that their anger is being measured (cf., De Houwer, 2006). Consequently, it is unlikely that participants adjust their answers according to their attributions as they might do in self-report measures of anger. In contrast to physiological arousal, this implicit measure may provide a more valid assessment of anger that is unlikely to be influenced by other processes like cognitive effort or empathy. On each trial of the measure, a nonsense word is flashed too briefly to be recognized consciously. Then, a list of words appears from which participants have to select the one that has been presented before. As they are unable to recognize it in a conscious fashion, they are told to rely on their feelings. The list consists of anger and aggression related words as well as of neutral words. The rationale of this measure is comparable to that of projective tests. That is, participants' selection of anger and aggression-related words is assumed to be indicative of their present feelings. As emotions consist of the components subjective experience, action tendencies, and cognitions, words representing these components are included in the measure (e.g., hostile, hurt, aggression).

Thereby, this measure may assess the activation of anger as well as the associated tendency to aggress (Anderson & Bushman, 2002; Berkowitz, 1990; Frijda, Kuipers, & ter Schure, 1989; Roseman, Wiest, & Swartz, 1994).

Two-third of participants were frustrated by negative evaluations combined with aversive sounds from an allegedly second participant, who was their partner in a virtual teamwork. The evaluations were based on an *acoustic evaluation scale*. This scale ranged from 1 (*very bad*) to 6 (*very good*). Each scale point was associated with a sound. The pleasantness of the sound corresponded to the meaning of the scale point. To manipulate attributions, half of the frustrated participants learned that their partner had confused the end points of the rating scale and had actually intended the opposite evaluation. This manipulation has the advantage that it is less likely to induce empathy than previous manipulations that have varied mitigating circumstances (Burnstein & Worchel, 1962; Johnson & Rule, 1986; Kremer & Stephens, 1983; Zillmann & Cantor, 1976). Furthermore, this procedure implies that the partner has even had positive intentions, which allows for a stronger test of the hypotheses. Thus, if attribution to unintentionality actually changes feelings then the present manipulation should not only decrease anger but should even induce positive feelings. If even under those conditions participants' implicit anger does not differ from that of intentionally frustrated participants, this would be strong evidence against the assumption that attribution to unintentionality decreases anger. In a control condition, participants received positive evaluations combined with pleasant sounds from their ostensible partner. The pattern of the positive ratings was the inverse pattern of the negative ratings that frustrated participants obtained. That is, the ratings of both groups had the same distance to the respective endpoints of the scale. This is a further advantage: Because the attribution manipulation in the unintentional frustration condition implies the reversed evaluations, this condition is identical to the control condition in terms of *propositionally*

represented evaluation, but it is identical to the intentional frustration condition in terms of *experienced* evaluation.

We measured aggressive behavior by means of the evaluations and the quality of the sounds that participants administered to their partner using the acoustic evaluation scale described above. This measure is similar to other measures of aggressive behavior in that participants decide to what degree they want to administer aversive stimuli to their partners (Anderson & Bushman, 1997; Giancola & Parrott, 2008; Giancola & Zeichner, 1995; Taylor, 1967; Turner & Berkowitz, 1972). To reduce the demand characteristic of such tasks (see Ritter & Eslea, 2005; Tedeschi & Quigley, 1996) the acoustic evaluation scale had positive as well as aggressive response options (i.e. pleasant and aversive sounds). According to Ritter and Eslea (2005), paradigms that offer various response options, ranging from prosocial to aggressive, are the best way to reduce demand characteristics.

In most of the studies on attribution and aggression, the dependent measures were assessed in a fixed order. However, the measures might be differently affected by each other. Recent research on goal pursuit suggests that reaching a goal reduces the accessibility of goal-relevant constructs (Förster, Liberman, & Higgins, 2005; Liberman & Förster, 2005). This has also been shown in the domain of aggression (Denzler, Förster, & Liberman, 2008). Applied to our study, these findings suggest that responding aggressively to the team partner may fulfill an aggression goal, which reduces the accessibility of related constructs. Because the implicit anger measure bears on experiential awareness it seems very plausible that it is influenced by construct accessibility. Thus, assessing aggressive behavior before implicit anger should extinguish differences in implicit anger. This should not be the case when implicit anger is assessed before aggressive behavior, because the implicit anger measure does not constitute an opportunity to fulfill an aggression goal. Although such order effects are highly relevant for the interpretation of effects on multiple measures, they rarely have

been examined in research on attribution and aggression. To gain further knowledge about such effects, we manipulated the order of the dependent measures.

In sum, we employed a 3 (intentional frustration vs. unintentional frustration vs. control) X 2 (type of measure: implicit anger vs. aggressive behavior) X 2 (order of measures: implicit anger first vs. aggressive behavior first) design with the factor type of measure varied within subjects. Following the assumptions of dual-system models and Berkowitz's aggression model, we predicted that the attributional information provided in the unintentional frustration condition reduces aggressive behavior but not implicit anger. Furthermore, implicit anger should be affected by the order of the measures such that differences in implicit anger disappear when it is measured after aggressive behavior. We expected no such order effects on aggressive behavior.

Method

Participants

Seventy-two male students of the University of Würzburg enrolled in different majors (excluding psychology) participated in exchange for €6 (approximately U.S. $7.60 at that time). The mean age was 24.62 years (*SD* = 4.88). We focused on male participants for two reasons. First, aggression research suggests that there are remarkable gender differences in aggressive behavior (Bettencourt & Miller, 1996; Eagly & Steffen, 1986). Because these differences are mainly due to differences in control of aggressive impulses (Campbell, 2006; Knight, Guthrie, Page, & Fabes, 2002) we would have expected complex interactions of gender, attribution, and type of measure. Second, most of previous studies on attribution and aggression that provided the basis for our study were conducted only on male participants (Epstein & Taylor, 1967; Johnson & Rule, 1986; Kremer & Stephens, 1983; Kulik & Brown, 1979; Nickel, 1974; Zillmann & Cantor, 1976). Up to three participants took part in the study at the same time. The work places were separated through moveable walls. One

participant was excluded from the analysis because he guessed the purpose of the study and the aim of the measures. Another participant was excluded because his implicit anger score deviated more than three standard deviations from the mean score. Thus, the data of seventy participants were analyzed.

Procedure

The experimenter explained the participants that the study was about virtual teamwork. Therefore, they would have to work together with another participant who was in the room next door. Then, the experimenter went to the room next door to check if the other participants were ready. After a short while, he came back and started the experiment. Participants read that the study investigated how the lack of nonverbal communication in a virtual teamwork situation could be compensated by additional options of acoustic communication. Therefore, the communication medium would be an acoustic evaluation scale with sounds ranging from pleasant to aversive. Then, participants were asked to introduce themselves to their partner by writing him an email. After a while, they received a message from their ostensible partner who introduced himself as a male student at the age of 24 years. Then, participants could test the sounds of the acoustic evaluation scale. After that, they completed a brainstorming task, in which they generated six names for a new energy drink. Their ideas were allegedly sent to the partner. Depending on conditions, participants received positive or negative evaluations for each idea by means of the acoustic evaluation scale. Participants in the unintentional frustration condition additionally obtained an email from their partner saying that he had actually meant the opposite evaluation. Then, participants completed the implicit anger measure and the aggressive behavior measure, with the order depending on conditions. In the aggressive behavior measure, participants evaluated ideas of their partner by means of the acoustic evaluation scale. Then, they could write an email to their partner to comment their evaluation. The implicit anger measure was

introduced as a test of subconscious language perception that was not part of the teamwork. After completing both measures, participants answered two open-ended suspicion check questions: “Did you notice something during the experiment?” “What do you think has been measured in the experiment?”. Finally, participants were debriefed and paid.

Materials

Frustration manipulation. Frustration was induced by the evaluations participants received from their partner. The evaluations were provided by means of an acoustic evaluation scale ranging from 1 (*very bad*) to 6 (*very good*) with sounds that were attached to the scale points. The valence of the sounds corresponded to the meaning of the scale points. The sounds were 1 s lasting consonant and dissonant accords recorded by a digital piano (Deutsch, 2002; see Appendix for valence ratings of the selected sounds). The dissonant accords were especially high-pitched. The intensity of the sounds was at a normal level and was the same for all sounds. The sounds were administered via headphones. In both frustration conditions, two ideas were evaluated with 1 and four ideas were evaluated with 2. In the control condition, two ideas were evaluated with 6 and four ideas were evaluated with 5.

Attribution manipulation. In the unintentional frustration condition, attribution to unintentionality was induced by an email participants received from their partner after having been evaluated. The email contained the German text “Hey, I think I confused the sounds. 6 means good and 1 means bad, isn’t it? I just noticed that. I thought it’s like school grades[2]. Anyways, I meant it like school grades. Sorry, Christian.”

Aggressive behavior measure. Aggressive behavior was measured by means of the evaluations participants gave their ostensible partner as a response to the six ideas he had developed in a brainstorming task. Participants used the same acoustic evaluation scale that was used for the frustration manipulation. Importantly, while evaluating each idea, they

could not hear the sounds themselves, because this would have meant hurting themselves as well.

Implicit measure of anger. The implicit measure of anger was introduced as a test of subconscious language perception, which was not part of the teamwork. The task consisted of 28 trials with 14 test trials and 14 filler trials. Each trial started with the presentation of an asterisk for 2000 ms to 5000 ms to focus participants' attention. Then, an ostensible target word was presented for 17 ms. Actually, the target word was a nonword letter string. This letter string was immediately covered by a mask of signs (####) that remained on the screen for 75 ms. Then, four words appeared. Participants had to select the target word. As the target word had been presented too briefly to be perceived consciously they were instructed to rely on their feelings while selecting a word. They were told that thereby their subconsciousness, which had been able to perceive the word, could guide their choice. In the 14 test trials, one of the four words was anger-related (see Appendix for a list of all target stimuli). All other words were neutral. The position of the anger-related word was rotated, and the trials were presented in randomized order.

Results

Answers to both suspicion check questions were coded with respect to (1) whether participants reported that the experiment had something to do with aggression, (2) whether participants reported that the negative feedback was meant to influence their evaluations of their partner, and (3) whether participants were aware of the fact that the subconscious language perception task measures anger. One participant reported awareness of all three facts and was therefore excluded from the analyses. From the remaining participants, five participants guessed that the experiment had something to do with aggression and one participant guessed that it was tested how negative feedback influences evaluations of their partner. No one was aware of the fact that the subconscious language perception task

measures anger. This further corroborates the assumption that the task is an implicit anger measure in the sense that participants are unaware of what is being measured. To control for possible effects of suspicion we entered suspicion rates as covariates in preliminary analyses.

An aggressive-behavior score was composed by calculating the mean of the six evaluations. To facilitate comparison with implicit anger we recoded the score such that higher values indicate more negative evaluations. An implicit anger score was composed by summing up the number of anger-related words that were selected in the subconscious language perception task (see DeMarree et al., 2005). Both scores were z-transformed and submitted to a 3 (frustration) X 2 (type of measure) X 2 (order of measures) Analysis of Variance (ANOVA) for repeated measures[3]. This ANOVA revealed a significant main effect of frustration, $F(2,64) = 9.15$, $p < .001$, $\eta^2 = .22$, and a significant interaction of frustration and type of measure, $F(2,64) = 6.72$, $p = .002$, $\eta^2 = .17$. Most importantly and consistent with predictions, the three-way interaction of frustration, type of measure, and order of measure was significant, $F(2,64) = 3.50$, $p = .036$, $\eta^2 = .10$. No other effect was significant, all Fs < 1.2. To further specify the nature of the three-way interaction, we conducted separate analyses for each measure.

A 3 (frustration) X 2 (order of measures) ANOVA on aggressive behavior yielded a significant main effect of frustration, $F(2,64) = 16.66$, $p < .001$, $\eta^2 = .34$. As shown in Figure 1, participants in the intentional frustration condition evaluated the ideas of their partner more negatively ($M = 3.45$, $SD = .43$) than participants in the unintentional frustration condition ($M = 2.70$, $SD = .96$), $t(64) = 3.50$, $p = .001$[4]. Furthermore, participants in the unintentional frustration condition evaluated the ideas of their partner more negatively than participants in the control condition, $t(64) = 2.28$, $p = .026$. Neither the main effect of order of measures nor the interaction of frustration and order of measures was significant, all Fs < 1.4.

A 3 (frustration) X 2 (order of measures) ANOVA on implicit anger yielded a marginally significant interaction of frustration and order of measures, $F(2,64) = 2.57$, $p = .084$, $\hat{\eta} = .07$. No other effect was significant, all Fs < 1.1. As can be seen in Figure 2, when the implicit anger measure was administered before the aggressive behavior measure, the number of selected anger-related words in the intentional frustration condition ($M = 4.18$, $SD = 2.44$) did not differ from those in the unintentional frustration condition ($M = 4.38$, $SD = 1.94$), $t < 1$. Yet, less anger-related words were selected in the control condition ($M = 2.64$, $SD = 1.50$) than in the intentional frustration condition, $t(64) = 2.00$, $p = .049$, or in the unintentional frustration condition, $t(64) = 2.36$, $p = .021$. When the implicit anger measure was administered after the aggressive behavior measure, the number of selected anger-related words did not differ between conditions (intentional frustration: $M = 3.17$, $SD = 1.70$; unintentional frustration: $M = 3.64$, $SD = 1.50$; control: $M = 3.83$, $SD = 1.59$), all ts < 1.

Discussion

The present findings suggest that attributing frustration to unintentionality decreases aggressive behavior but not anger. In particular, when participants were frustrated by an ostensible team partner and received a message suggesting that their partner did not intend this frustration, they reacted less aggressively towards their partner than participants who did not receive such a message, but more aggressively than non-frustrated participants. Implicit anger, however, was unaffected by this message. More specifically, when implicit anger was measured before aggressive behavior, frustrated participants showed higher anger than non-frustrated participants, regardless of attribution. Yet, when implicit anger was measured after aggressive behavior, frustrated and non-frustrated participants did not differ.

The present results support the notion that attribution to unintentionality does not reduce anger and aggressive impulses but increases control of aggressive impulses. This is

consistent with Berkowitz's aggression model (Berkowitz, 1990), which states that irrespective of appraisals or attributions, negative stimulation is sufficient to activate anger and aggressive tendencies. Furthermore, the present research is in line with dual-system models such as the RIM (Strack & Deutsch, 2004), by showing that the knowledge that a frustration was not intended failed to influence implicit anger and exerted its effect only on aggressive behaviors that are based on conscious decisions. In a similar vein, the General Aggression Model (*GAM*; Anderson & Bushman, 2002) assumes that spontaneous aggressive behavior is based on immediate appraisals, whereas thoughtful aggressive behavior is influenced by resource-dependent reappraisal processes. Our results add to the GAM by showing that reappraisals influence controlled behavior but not implicit anger.

The finding that implicit anger was affected by our manipulations only if it was measured before the execution of aggressive behavior but not afterwards adds to the sparse knowledge about reactive effects of different measures of aggression. The present results are consistent with the motivational principle that goal-fulfillment reduces the accessibility of goal-related constructs (Denzler et al., 2008; Förster et al., 2005; Zeigarnik, 1927). In particular, the opportunity to administer negative evaluations may have reduced the accessibility of anger-related constructs, thereby extinguishing any differences in implicit anger. Yet, one may criticize that the absence of any differences in implicit anger when assessed after aggressive behavior might be due to the fact that anger simply decreased over time. However, as we did find strong effects on aggressive behavior when assessed after implicit anger this interpretation seems unlikely.

Limitations

Of course, the present findings also have their limitations that should be observed when generalizing the effects. A first possible limitation is the fact that we only had male participants. Yet, we believe that there is no reason to assume that the mechanisms are

gender specific. In particular, research has shown that women equally experience anger but tend to control their aggressive behavior more than men (Campbell, 2006; Eagly & Steffen, 1986; Knight et al., 2002). Therefore, it seems plausible that also among females, attribution may affect controllable aggressive behavior more than implicit anger. A second possible limitation is the interpretation of the implicit measure of anger. As the measure did not include negative mood control words that are unrelated to anger we can not rule out the alternative interpretation that our manipulations may have influenced general negative affect rather than specific anger. But even if this were the case, the findings continue to support our hypothesis that attribution to unintentionality does not influence affect but rather controllable behavior. A third possible limitation concerns the nature of the attribution process. In particular, like in everyday apologies attributional information was given after participants had already experienced negative treatment. Thus, we do not know if attribution to unintentionality might have had a stronger impact on affect when processed before the negative treatment (cf., Johnson & Rule, 1986; Zillmann & Cantor, 1976). A final possible limitation might be that our experimental strategy has relied on the comparison of two different measures. The measures may not only differ in their implicitness but also in other respects, from which we do not know if they also may have caused the effects. For instance, research on the consistency of implicit and explicit attitudes suggests that a structural fit can influence correlations among measures (Payne, Burkley, & Stokes, 2008). Yet, as we did not simply look at the degree of correlations but rather demonstrated that the measures were differently affected by one manipulation (i.e. attribution) while they were similarly affected by another manipulation (i.e. frustration) we deem the results to be convincing.

Implications

The present findings have several implications. First, they challenge attribution theory (Weiner, 1985; Weiner et al., 1982) as well as appraisal theories (Lazarus, 1991; Roseman,

2004; Smith & Kirby, 2004), which assume that attribution to intentionality is a necessary appraisal for anger to be elicited. Because our attribution manipulation implies that the partner actually meant a positive evaluation, our finding is even more striking than previous studies that manipulated attribution by providing an excuse for the partner's frustrating behavior (e.g., Dill & Anderson, 1995; Kremer & Stephens, 1983). More specifically, although participants knew that their partner actually liked their ideas, this knowledge did not reduce the anger that had been elicited by the negative treatment. One alternative explanation is that the attribution information was processed more superficially than the negative evaluation because the latter was more self-relevant. To test this explanation we analyzed as a proxy for depth of processing whether participants mentioned their partner's apology in their email answer. Although this measure may be also affected by other factors like the motivation to establish a pleasant interaction, this analysis may still provide preliminary evidence about this alternative explanation. From the 24 participants in the unintentional frustration condition, nine mentioned the apology in their email answer. Importantly, implicit anger did not differ as a function of this post-hoc factor, $F < 1$. Thus, it seems unlikely that the effects on implicit anger were due to superficial processing.

Second, the present study has implications for research on emotion regulation (Gross, 1998b). In contrast to our results, this research suggests that reappraisal is a very successful strategy in emotion regulation, especially in the case of anger (e.g., Mauss, Cook, Cheng, & Gross, 2007; Ray, Wilhelm, & Gross, 2008). This apparent inconsistency raises several interesting questions. First, as we used a different measure than most studies on emotion regulation, which mainly assessed self-reported anger or physiological arousal, it may be worthwhile to examine the generality across different measures. Second, whereas research on emotion regulation mainly tested how the instruction to remain objective affects emotions (e.g., Gross, 1998a), we investigated the effects of a communication that implied a

reappraisal. As these manipulations differ in several respects like the timing of the appraisal and the experimental demand to change feelings, it may be interesting to investigate these factors. Third, it seems desirable to further explore the effects of reappraisal over a longer time period. Although we found no short-term decrease of anger it is possible that attributions may influence the duration of anger (cf. Beck & Fernandez, 1998). Finally, as recent publications highlighted the possibly automatic nature of emotion regulation (Koole & Jostmann, 2004; Mauss, Cook, & Gross, 2007; Webb & Sheeran, 2003) it may be interesting to investigate how automatic emotion regulation affects the influence of attribution on anger.

Conclusions

In conclusion, the present study provides a contribution to the question how attribution of frustration to unintentionality influences aggression. By testing the effects of attribution to unintentionality on an implicit measure of anger as compared to an aggressive behavior measure, we demonstrated that such an attribution decreased only aggressive behavior, but not implicit anger. These findings support the notion that attributions to unintentionality mainly lead to control of aggressive impulses. This is in line with models of aggression (e.g., Berkowitz, 1990) that propose anger and aggression to be elicited by unpleasant experiences irrespective of appraisals. Furthermore, the results are consistent with dual-system models (e.g., Strack & Deutsch, 2004), which suggest that propositional processes predominantly influence behavior that is under conscious control, while impulsive outcomes remain unaffected.

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Appendix

Valence ratings of the sounds used in the evaluation tasks

The sounds used in the evaluation tasks had the following valence ratings on a scale from 1 (*very negative*) to 6 (*very positive*). Sound 1: $M = 1.17$, $SD = 0.48$, Sound 2: $M = 1.54$, $SD = 0.65$, Sound 3: $M = 1.60$, $SD = 0.79$, Sound 4: $M = 3.23$, $SD = 1.17$, Sound 5: $M = 4.52$, $SD = 0.99$, Sound 6: $M = 5.02$, $SD = 0.89$ (Deutsch, 2002).

Anger-related words used in the implicit anger measure

Aggression [aggression], Ärger [anger], brutal [brutal], Gewalt [violence], grausam [violent], feindselig [hostile], hassen [hate], verletzen [hurt], töten [kill], angreifen [attack], Wut [fury], zerstören [destroy], Zorn [rage], schlagen [beat]

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Footnotes

[1] The implicit mood measure has been validated by Hass et al. (1992) using a common mood induction procedure. Their findings suggest that it measures mood rather than unspecific arousal or salience of emotional words. Another alternative explanation of the measure, namely that it assesses activation of semantic representations, has been discussed by DeMarree et al. (2005). They argue that their results make this interpretation unlikely. They found an increase of implicit anger after stereotypic priming only among low self-monitoring but not among high self-monitoring participants. If this effect were due to priming of stereotypic associations one would have expected a stronger effect among high self-monitors because of their more elaborated and more accessible stereotypic representations as well as because of their greater tendency to rely on stereotypes.

[2] German school grades range from 1 (*very good*) to 6 (*insufficient*).

[3] In preliminary analyses, we included suspicion rates as covariates. As the effects of the covariates were not significant and all other results virtually were the same, we dropped the covariates of the main analysis.

[4] We conducted LSD post-hoc tests for all simple comparisons reported in the results section.

Figure Captions

Figure 1. Measure of aggressive behavior. Mean evaluation of the partner's ideas. Higher values indicate more negative evaluations. Bars represent standard errors of the mean.

Figure 2. Implicit measure of anger. Mean number of selected anger-related words. Bars represent standard errors of the mean.

Figure 1

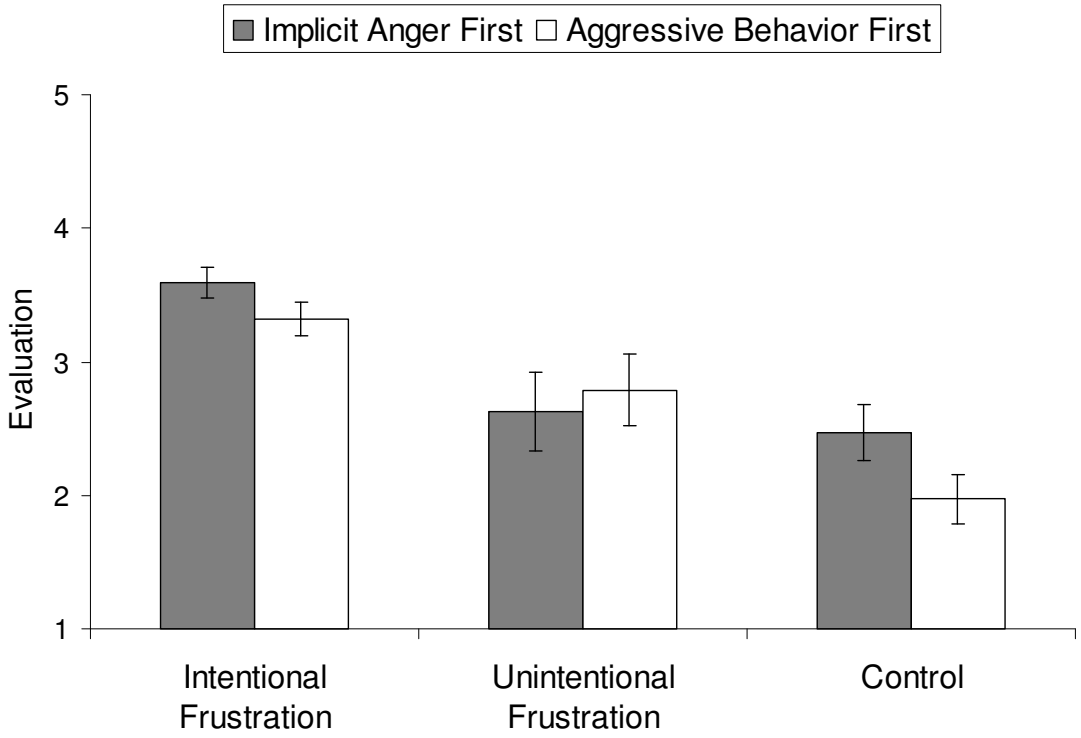

Figure 2